

In the Claims:

Please cancel claims 42 and 51.

Please amend the claims as follows:

41. (Amended) A combinatorial library of different sequence peptide or peptidomimetic members synthesized on solid phase, where each constituent library member comprises:

(a) a sequence of between three and about twenty amino acid residues, mimics of amino acid residues or combinations thereof, bound to solid phase characterized by (i) a sequence of two or more amino acid residues, mimics of amino acid residues or combinations thereof, forming a metal ion-binding backbone for complexing with a metal ion and comprising at least one residue with at least one sulfur available for binding to a metal ion in solution, (ii) one or more amino acid residues, mimics of amino acid residues or combinations thereof, at the N- or C- terminus of the metal ion-binding backbone, or at both the N- and C-terminus of the metal ion-binding backbone, and (iii) a cleavable bond attaching the sequence to solid phase; and

(b) a unique selection or sequence of amino acid residues, mimics of amino acid residues or combinations thereof.

43. (Amended) The combinatorial library of claim 41 wherein the metal ion-binding backbone further comprises at least one residue with at least one nitrogen available for binding to a metal ion.

44. (Amended) The combinatorial library of claim 41 wherein the metal ion-binding backbone comprises three residues forming an N_3S_1 metal ion complexation group.

45. (Amended) The combinatorial library of claim 41 wherein the at least one sulfur is protected by a cleavable S-protecting group.

46. (Amended) The combinatorial library of claim 45 wherein the cleavable S-protecting group is trityl.

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47. (Amended) The combinatorial library of claim 41 wherein the unique selection or sequence occurs in the metal ion-binding backbone.

48. (Amended) The combinatorial library of claim 41 wherein the unique selection or sequence occurs in the one or more amino acid residues, mimics of amino acid residues or combinations thereof, at the N- or C- terminus of the metal ion-binding backbone, or at both the N- and C-terminus of the metal ion-binding backbone.

49. (Amended) The combinatorial library of claim 41 wherein the at least one residue containing at least one sulfur available for binding to a metal ion is L- or D-cysteine; L- or D-penicillamine; L- or D-homocysteine; 2'-mercapto-tryptophan; N^B-(2 mercaptoethane)-α,β-diaminopropionic acid; 2-mercaptoethylamine; thioglycolic acid; mercaptopropionic acid; 2-mercaptoaniline; or 2-mercaptosuccinic acid.

50. (Amended) A combinatorial library of different sequence peptide or peptidomimetic members synthesized in solution, where each constituent library member comprises:

(a) a sequence of between three and about twenty amino acid residues and mimics of amino acid residues in solution characterized by (i) a sequence of two or more amino acid residues, mimics of amino acid residues or combinations thereof forming a metal ion-binding backbone for complexing with a metal ion and comprising at least one residue with at least one sulfur available for binding to a metal ion in solution, and (ii) one or more amino acid residues, mimics of amino acid residues or combinations thereof at the N- or C- terminus of the metal ion-binding backbone, or at both the N- and C-terminus of the metal ion-binding backbone; and

(b) a unique selection or sequence of amino acid residues, mimics of amino acid residues or combinations thereof.

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52. (Amended) The combinatorial library of claim 50 wherein the metal ion-binding backbone further comprises at least one residue with at least one nitrogen available for binding to a metal ion.

53. (Amended) The combinatorial library of claim 50 wherein the metal ion-binding backbone comprises three residues forming an N₃S₁ metal ion complexation group.

54. (Amended) The combinatorial library of claim 50 wherein the at least one sulfur is protected by a cleavable S-protecting group.

55. (Amended) The combinatorial library of claim 54 wherein the cleavable S-protecting group is trityl.

56. (Amended) The combinatorial library of claim 50 wherein the unique selection or sequence occurs in the metal ion-binding backbone.

57. (Amended) The combinatorial library of claim 50 wherein the unique selection or sequence occurs in the one or more amino acid residues, mimics of amino acid residues or combinations thereof, at the N- or C- terminus of the metal ion-binding backbone, or at both the N- and C-terminus of the metal ion-binding backbone.

58. (Amended) The combinatorial library of claim 50 wherein the at least one residue containing at least one sulfur available for binding to a metal ion is L- or D-cysteine; L- or D-penicillamine; L- or D-homocysteine; 2'-mercapto-tryptophan; N⁸-(2 mercaptoethane)- α,β -diaminopropionic acid; 2-mercaptoethylamine; thioglycolic acid; mercaptopropionic acid; 2-mercaptoaniline; or 2-mercaptosuccinic acid.

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59. (Amended) The combinatorial library of claim 50 wherein each constituent library member further comprises a metal ion complexed to the metal ion-binding backbone.

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Please add the following new claims:

--63. The combinatorial library of claim 41, wherein each constituent library member further comprises a metal ion complexed to the metal ion-binding backbone.

64. The combinatorial library of claim 63, wherein the metal ion is selected from the group of metals consisting of technetium and rhenium.

65. The combinatorial library of claim 44, further comprising a metal ion complexed to the N_3S_1 metal ion complexation group.

66. The combinatorial library of claim 65, wherein the metal ion is selected from the group of metals consisting of technetium and rhenium.

67. The combinatorial library of claim 50, further comprising a metal ion complexed to the metal ion-binding domain.

68. The combinatorial library of claim 67, wherein the metal ion is selected from the group of metals consisting of technetium and rhenium.

69. The combinatorial library of claim 52, further comprising a metal ion complexed to the N_3S_1 metal ion complexation group.

70. The combinatorial library of claim 69, wherein the metal ion is selected from the group of consisting of technetium and rhenium.

71. A combinatorial library comprising compounds of the structure:

R_1-X-R_2

wherein X is a complexing backbone for complexing a metal ion comprising between two and four amino acids, wherein at least two amino acids are contiguous and at least one residue comprises at least one sulfur available for binding to a metal ion, so that substantially all of the valences of the metal ion are satisfied upon complexation of the metal ion with X;

wherein R_1 and R_2 each comprise from 0 to about 20 amino acids; and

a metal ion complexed to X;

wherein R_1-X-R_2 has a conformationally constrained secondary structure comprising at least a part of X and at least a part of R_1 or R_2 .

72. The combinatorial library of claim 71, wherein the metal ion is an ionic form of the element selected from the group consisting of iron, cobalt, nickel, copper, zinc, manganese, arsenic, selenium, technetium, ruthenium, palladium, silver, cadmium, indium, antimony, rhenium, osmium, iridium, platinum, gold, mercury, thallium, lead, bismuth, polonium or astatine.

73. The combinatorial library of claim 71, wherein the metal ion is selected from the group of consisting of technetium and rhenium.

74. The combinatorial library of claim 71, wherein the at least one residue containing at least one sulfur available for binding to a metal ion is L- or D-cysteine; L- or D-penicillamine; L- or D-homocysteine; 2'-mercapto-tryptophan; N^B-(2 mercaptoethane)-α,β-diaminopropionic acid; 2-mercaptopethylamine; thioglycolic acid; mercaptopropionic acid; 2-mercaptoaniline; or 2-mercaptosuccinic acid.

75. The combinatorial library of claim 71 wherein X comprises at least one residue with at least one nitrogen available for binding to a metal ion.

76. The combinatorial library of claim 71 wherein X is three residues forming an N₃S₁ metal ion complexing backbone.

77. The combinatorial library of claim 71, wherein the conformationally constrained secondary structure is a specific regional secondary structure which is a mimic of a reverse turn structure.

78. The combinatorial library of claim 71, wherein if less than all of the valences of the metal ion are otherwise satisfied upon complexation of the metal ion with the amino acids comprising X, then X also comprises a derivatized amino acid or spacer sequence, which derivatized amino acid or spacer sequence comprises at least one nitrogen, sulfur or oxygen atom available for complexing with the

available valences of the metal ion, so that all of said valences of the metal ion are satisfied upon complexation of the metal ion with X.

79. The combinatorial library of claim 71, wherein the compounds of the structure R₁-X-R₂

are linear peptides complexed to a metal ion.

80. The combinatorial library of claim 71, wherein each of R₁ and R₂ comprise at least one

amino acid, and further wherein R₁ and R₂ are joined by a cyclic bridge, whereby R₁-X-R₂ are cyclic peptides complexed to a metal ion.

81. The combinatorial library of claim 71, wherein the compounds of the structure R₁-X-R₂ are

bound to solid phase.--
